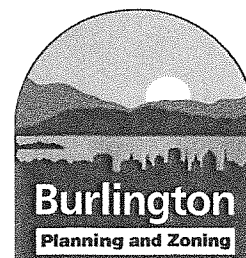


Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
(802) 865-7195 (FAX)
(802) 865-7142 (TTY)

David White, AICP, Director
Ken Lerner, Assistant Director
Sandrine Thibault, AICP, Comprehensive Planner
Jay Appleton, GIS Manager
Scott Gustin, AICP, Senior Planner
Mary O'Neil, AICP, Associate Planner
Nic Anderson, Zoning Clerk
Elsie Tillotson, Department Secretary



TO: Development Review Board
FROM: Scott Gustin *SG*
DATE: September 6, 2011
RE: 12-0188CA/MA; 0 Starr Farm Beach Road

Note: These are staff comments only; decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

Zone: WRL Ward: 4

Owner/Applicant: William S Parkhill / Krebs & Lansing Consulting Engineers, Inc.

Request: Lakeshore reinforcement along the Starr Farm Beach camp beaches consisting of rip rap and seawalls.

Applicable Regulations:

Article 3 (Applications, Permits, and Project Reviews), Article 4 (Maps & Districts), Article 5 (Citywide General Regulations), Article 6 (Development Criteria & Guidelines)

Background Information:

The applicants are seeking approval to construct a series of new and replacement rip rap installments and seawalls along the Starr Farm Beach lakeshore. The work is in response to flooding this past spring and is intended to prevent future damage. Associated fill and grading work is also proposed. As the construction is located partially below the 102' elevation, it is subject to review under the flood hazard area regulations in addition to dimensional and design review standards. As required, the project is subject to review and approval by the State National Floodplain Insurance Program Coordinator at VT DEC. A copy of the application was provided to the Coordinator on August 12, but no response has yet been received. The Coordinator has 30 days to respond. Any comments received within the 30 day period will be incorporated into this approval. As this proposal includes more than just a single family dwelling, it is subject to major impact review.

Recommendation: Consent approval as per, and subject to, the following findings and conditions:

I. Findings

Article 3: Applications and Reviews

Part 5, Conditional Use & Major Impact Review:

Sec. 3.5.6, Review Criteria

(a) Conditional Use Review Standards

1. The capacity of existing or planned community facilities;

The proposed seawalls and rip rap will have no impact on existing or planned community facilities. **(Affirmative finding)**

2. The character of the area affected;

Seawalls and rip rap are commonly employed as lakeshore stabilization measures along the Burlington waterfront. The proposed work consists of new and replacement measures and is consistent with other lakeshore stabilization measures along Burlington's lakeshore. **(Affirmative finding)**

3. Traffic on roads and highways in the vicinity;

Not applicable.

4. Bylaws then in effect;

As conditioned, the project complies with all applicable bylaws. **(Affirmative finding)**

5. Utilization of renewable energy resources;

Not applicable.

6. Cumulative impacts of the proposed use;

Not applicable.

7. Functional family;

Not applicable.

8. Vehicular access points;

Not applicable.

9. Signs;

Not applicable.

10. Mitigation measures;

Not applicable.

11. Time limits for construction;

The application requests a 2-year time frame for the permit. Two years is standard for all zoning permits as conditioned. No change to the standard time frame is needed. **(Affirmative finding as conditioned)**

12. Hours of operation and construction;

Hours of operation are not applicable. Days and hours of construction are not specified and must be, given the nearby presence of residential dwelling units. **(Affirmative finding as conditioned)**

13. Future enlargement or alterations;

In the event of future enlargement or alteration, permits would be required and reviewed under the regulations then in effect.

14. Performance standards;

Performance standards relating to outdoor lighting and erosion control are addressed under Article 5 of these findings.

15. Conditions and safeguards;

Approval of this project will be conditioned to implement the purposes of the zoning regulations.
(Affirmative finding)

(b) Major Impact Review Standards

1. Not result in undue water, air, or noise pollution;

The proposed construction will reduce or eliminate shoreline erosion into the lake. In doing so, sedimentation and associated nutrient loading into the lake from the subject properties will be abated. An erosion control plan for the proposed work has been reviewed and approved by the Stormwater Administrator. That approval and associated conditions will be incorporated into this permit. **(Affirmative finding as conditioned)**

2. Have sufficient water available for its needs;

Not applicable.

3. Not unreasonably burden the city's present or future water supply or distribution system;

Not applicable.

4. Not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result;

The proposed work is being performed in order to arrest existing shoreline erosion along the lake. As noted above, an erosion control plan for this project has been reviewed and approved by the Stormwater Administrator. **(Affirmative finding)**

5. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;

Not applicable.

6. Not cause an unreasonable burden on the city's ability to provide educational services;

Not applicable.

7. Not place an unreasonable burden on the city's ability to provide municipal services;

Not applicable.

8. Not have an undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, nor on the scenic or natural beauty of the area or any part of the city;

See Sec. 6.2.2.

9. Not have an undue adverse effect on the city's present or future growth patterns nor on the city's fiscal ability to accommodate such growth, nor on the city's investment in public services and facilities;

Not applicable.

10. Be in substantial conformance with the city's municipal development plan;

See Sec. 4.5.4 (a) 7 H.

11. Not have an undue adverse impact on the present or projected housing needs of the city in terms of amount, type, affordability and location;

Not applicable.

12. Not have an undue adverse impact on the present or projected park and recreation needs of the city.

Not applicable.

Article 4: Maps & Districts

Sec. 4.4.5, Residential Districts:

(a) Purpose

(2) Waterfront Residential Low Density (WRL)

The subject properties are located in the WRL zone. This zone is intended primarily for low density residential development in the form of single detached dwellings and duplexes with consideration given to design review. The single family use of the individual properties, whether seasonal or not, will remain unchanged. **(Affirmative finding)**

(b) Dimensional Standards & Density

The width of the proposed seawalls and rip rap varies with the contours of the lakeshore. In all cases, the width appears to exceed 18". As a result, lot coverage will increase. No lot coverage figures have been provided. Lot coverage appears to be acceptable; however, confirmation of compliance with the 35% coverage limit for each individual property is needed. The proposed construction is located within the 75' lakeshore setback; however, its degree of encroachment will not exceed that of nearby seawalls or rip rap. Furthermore, walls (i.e. retaining walls and seawalls) are specifically allowed to encroach into setbacks per Sec. 5.2.5, *Setbacks*, (b) *Exceptions to Yard Setback Requirements*. In all cases, the proposed construction is well under the maximum allowable height of 35'. **(Affirmative finding as conditioned)**

(c) Permitted & Conditional Uses

The proposed seawalls and rip rap are accessory to the permitted single family homes.

(Affirmative finding)

(d) District Specific Regulations

1. Setbacks

See Sec. 4.4.5 (b) above for setback encroachment.

2. Height

Not applicable.

3. Lot Coverage

Not applicable.

4. Accessory Residential Structures and Uses

Not applicable.

5. Residential Density

Not applicable.

6. Uses

Not applicable.

7. Residential Development Bonuses

Not applicable.

Sec. 4.5.4, Natural Resource Protection Overlay District:

(a) District Specific Regulations: Special Flood Hazard Area

(7) Special Review Criteria

A. The danger to life and property...

The seawalls and rip rap will be placed within the lakeshore flood hazard area. As noted with other similar applications, lakeshore flood dynamics are unlike those of river flood dynamics. The water does not flow at perceptible speeds and is not subject to constriction. Placement of the seawalls and rip rap within the lakeshore flood zone will have no impact on flood heights or velocities. **(Affirmative finding)**

B. The danger that material may be swept onto other lands...

The proposed construction will utilize large dimensional quarried stone. There is little danger that the structure will be swept away by flood waters. **(Affirmative finding)**

C. The proposed water supply and sanitation systems...

Not applicable.

D. The susceptibility of the proposed facility and its contents to flood damage...

The proposed work is a protective measure against flood damage to the property. The potential for flooding damage to the seawall and rip rap themselves is minimal. **(Affirmative finding)**

E. The importance of the services provided...

The proposed work is of little importance to the Burlington community; however, it will provide substantial protection to the private properties that it will be located on. **(Affirmative finding)**

F. The availability of alternative locations...

The proposed work is intended to protect the subject properties from flood damage. Its placement within the flood zone is linked specifically to this function. Its location within the floodplain is acceptable. **(Affirmative finding)**

G. The compatibility of the proposed use with existing development...

Seawalls and rip rap are commonplace along Burlington's lakeshore. **(Affirmative finding)**

H. The relationship of the proposed use to the Municipal Development Plan...

The Municipal Development Plan does not address seawalls or rip rap. It does speak to the development pattern of single family homes and duplexes in the RL and WRL zones. The subject properties contain single family homes. Insofar as homes along the lakeshore commonly have seawalls and rip rap, the proposal can be found in compliance with the MDP. **(Affirmative finding)**

I. The safety of access to the property...

The new seawalls and rip rap will have no effect on the safety of access to the properties during times of flood. **(Affirmative finding)**

J. The expected heights, velocity, duration, rate of rise...

The maximum regulatory flood elevation along the lakeshore is 102' above sea level. The proposed work will have no impact on flood heights, velocity, duration, rate of rise, or sediment transport. **(Affirmative finding)**

K. Conformance with all other applicable requirements...

See Articles 4, 5, and 6 of these findings.

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

See Sec. 4.4.5 (b) above.

Sec. 5.2.4, Buildable Area Calculation

Not applicable.

Sec. 5.2.5, Setbacks

See Sec. 4.4.5 (b) above.

Sec. 5.2.6, Building Height Limits

See Sec. 4.4.5 (b) above.

Sec. 5.2.7, Density and Intensity of Development Calculations

See Sec. 4.4.5 (b) above.

Sec. 5.5.1, Nuisance Regulations

Nothing in the proposal appears to result in creating a nuisance under this criterion. **(Affirmative finding)**

Sec. 5.5.3, Stormwater and Erosion Control

As this project is subject to major impact review, it requires a comprehensive erosion control plan for utilization during construction. Such a plan has been reviewed and approved by the Stormwater Administrator. The approved plan and associated conditions will be incorporated into this permit approval. No post-construction stormwater management measures are included in this proposal, nor are they required. **(Affirmative finding as conditioned)**

Article 6: Development Review Standards

Part 1, Land Division Design Standards

Not applicable.

Part 2, Site Plan Design Standards

Sec. 6.2.2, Review Standards

(a) Protection of important natural features

The subject properties are located along the Lake Champlain shoreline. The shoreline is an identified significant natural area. As with most of the Burlington lakeshore, much of the properties are affected by the Natural Resource Protection Overlay District, specifically the

riparian and littoral conservation zone, which stretches inland 250' from the 100' lakeshore elevation. As required, an erosion control plan has been reviewed and approved for this project by the Stormwater Administrator. Post-construction stormwater management is not required for this project. No tree cutting is noted in this proposal. If any is proposed, clearing limits must be clearly depicted on the plans and comply with cutting restrictions associated with the riparian and littoral conservation zone. **(Affirmative finding as conditioned)**

(b) Topographical alterations

The subject properties slope towards the lake at varying degrees of steepness. The proposed seawalls and rip rap will work with the existing contours of the land and are acceptable.

(Affirmative finding)

(c) Protection of important public views

Not applicable.

(d) Protection of important cultural resources

Not applicable.

(e) Supporting the use of alternative energy

Not applicable.

(f) Brownfield sites

Not applicable.

(g) Provide for nature's events

See Sec. 5.5.3.

(h) Building location and orientation

Not applicable.

(i) Vehicular access

Not applicable.

(j) Pedestrian access

Not applicable.

(k) Accessibility for the handicapped

Not applicable.

(l) Parking and circulation

Not applicable.

(m) Landscaping and fences

No new landscaping is proposed. Vegetative screening of concrete seawalls has been required in the past. As the proposed work will be constructed of quarried stone similar in appearance to the naturally occurring ledge in the area, no screening is required. Seawalls in excess of 3' in height will be subject to review and approval by the City Engineer via the associated building permit application. **(Affirmative finding as conditioned)**

(n) Public plazas and open space
Not applicable.

(o) Outdoor lighting
Not applicable.

(p) Integrate infrastructure into the design
Not applicable.

Part 3, Architectural Design Standards

Sec. 6.3.2, Review Standards

Not applicable.

II. Conditions of Approval

1. **Prior to release of the zoning permit**, revised plans depicting lot coverage for each individual lot and tree clearing limits (if applicable) in compliance with the riparian and littoral conservation zone shall be submitted, subject to staff review and approval.
2. **Prior to release of the zoning permit**, a construction schedule with the days and hours of operation shall be submitted, subject to staff review and approval.
3. This approval incorporates the erosion prevention and sediment control plan approved by the Stormwater Administrator 8/30/11.
4. This approval incorporates timely comments and stipulations issued by the State National Floodplain Insurance Program Coordinator at VT DEC as related to this project.
5. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required, and shall meet all energy efficiency codes as required.
6. Standard permit conditions 1-18.

KREBS & LANSING

Consulting Engineers, Inc.

164 Main Street, Suite 201
Colchester, VT 05446
Tel (802) 878-0375 • Fax (802) 878-9618
klengineers@comcast.net

August 10, 2011

Scott Gustin
Burlington Dept. of Planning & Zoning
149 Church Street
Burlington, VT 05401

RE: Starr Farm Beach Owners Association
Proposed Lakeshore Reinforcement Plan
Burlington, VT

Dear Scott,

Please find the enclosed Zoning Permit application for the Starr Farm Beach Camp Owner's Association. The applicants are proposing to construct several new and replacement retaining walls/shore reinforcements on their Lake Champlain shoreline. We have enclosed plans showing the location of proposed improvements.

The purpose of this work is to stop the erosion caused by this year's flooding. The existing vegetation on the banks was removed by the high water and wave action this spring. This resulted in exposed sandy banks that are sloughing off into the lake. The applicants are anxious to complete the work this fall in order to have the proposed protection in place before the high water next spring. Since it may be difficult to contract for and/or complete all of the work this fall, the applicants would like to request a two-year duration for this permit.

The applicants are proposing two options to repair and stabilize the shoreline:

Option 1: Dimensional riprap stone wall backfilled with shot rock.

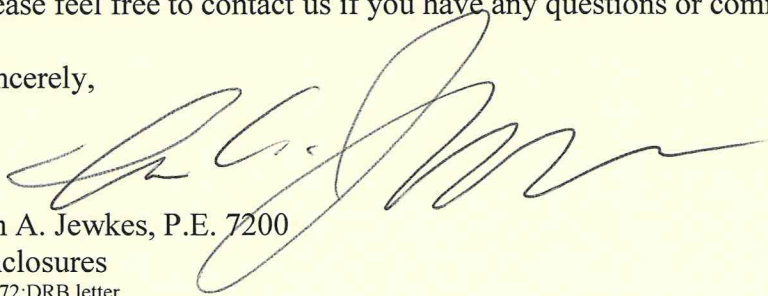
Option 2: Type I rip rap stone

Pictures of both options are shown on the Lakeshore Reinforcement Plans.

We have also included attachments showing the existing design plans for proposed and existing retaining walls for the Sullivan ("*Proposed Lakeshore Stabilization*") and Glen Parker ("*New Seawall at 30 Starr Farm Road*") lots which would be built concurrently.

Please feel free to contact us if you have any questions or comments.

Sincerely,

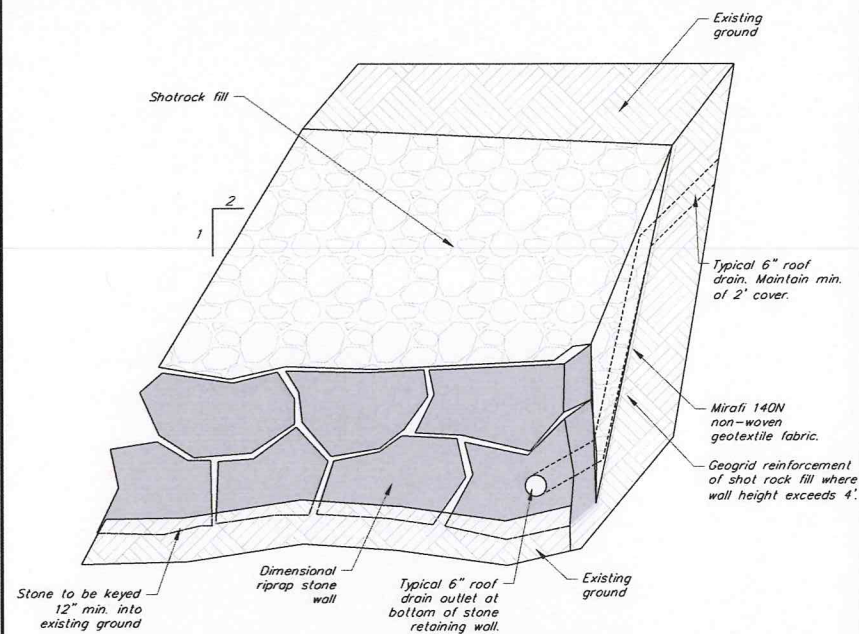


Ian A. Jewkes, P.E. 7200
Enclosures
11172:DRB letter

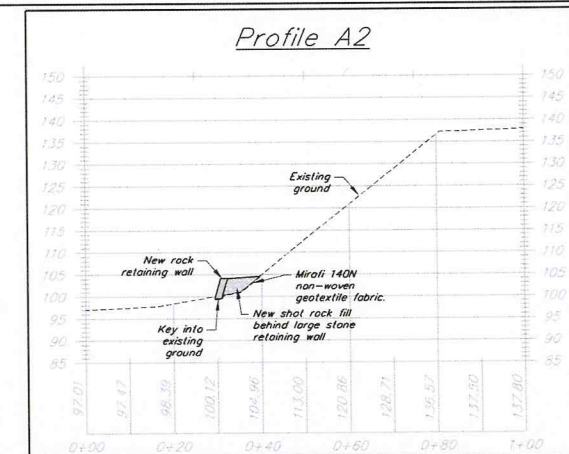
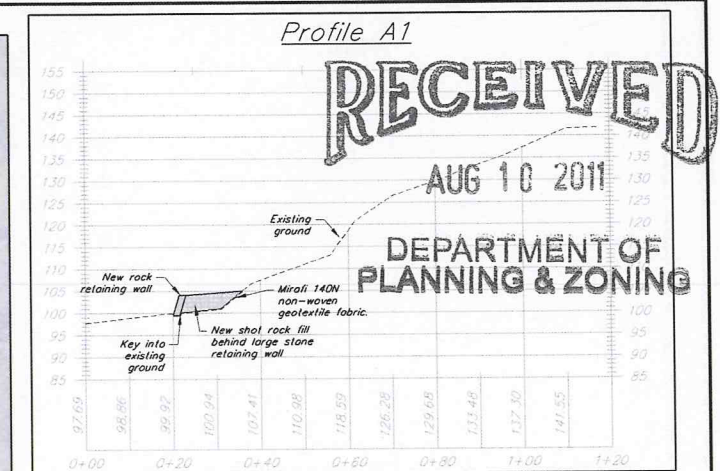
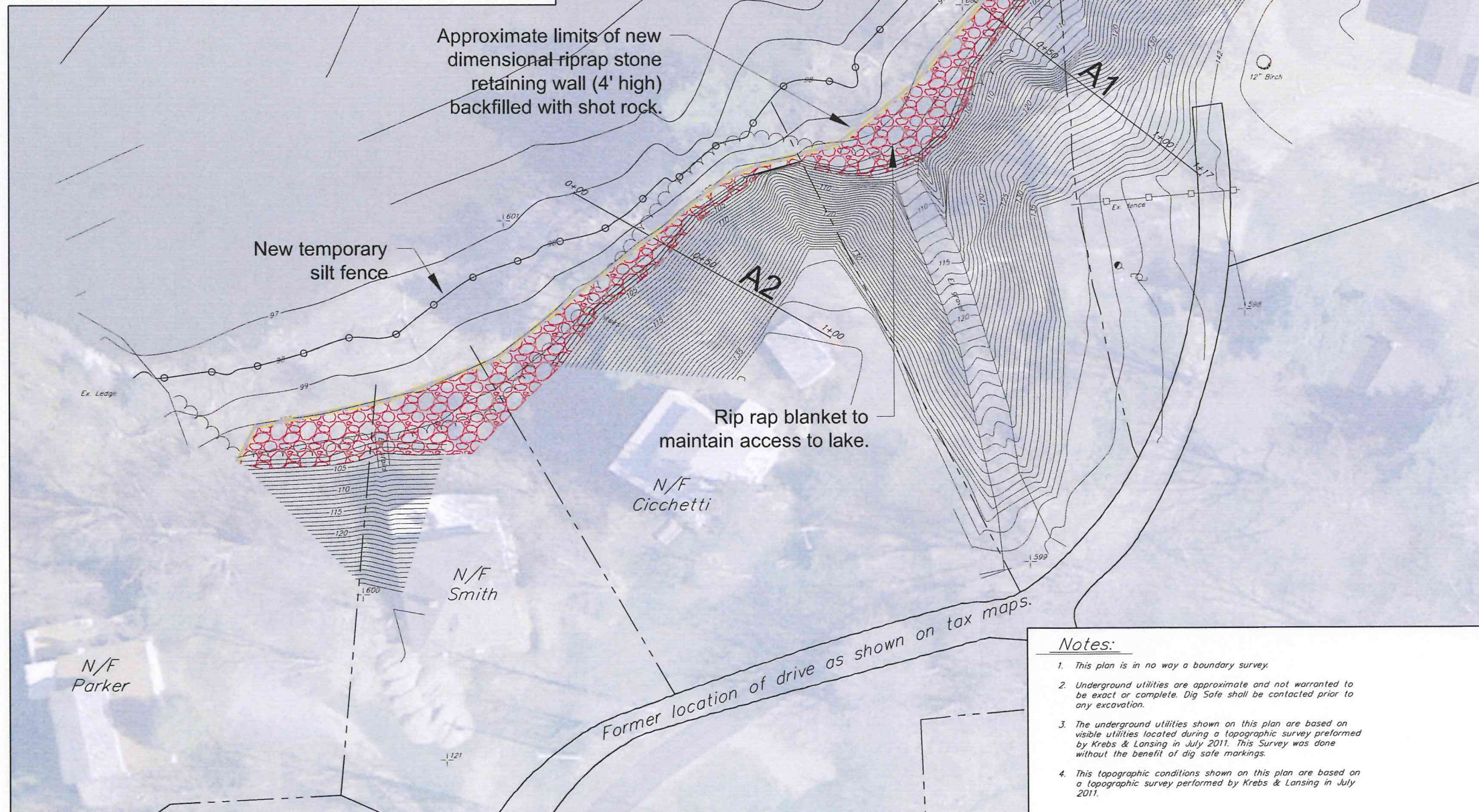
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AUG 10 2011

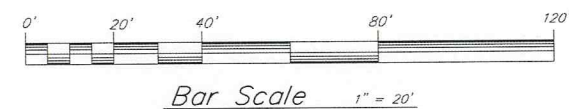
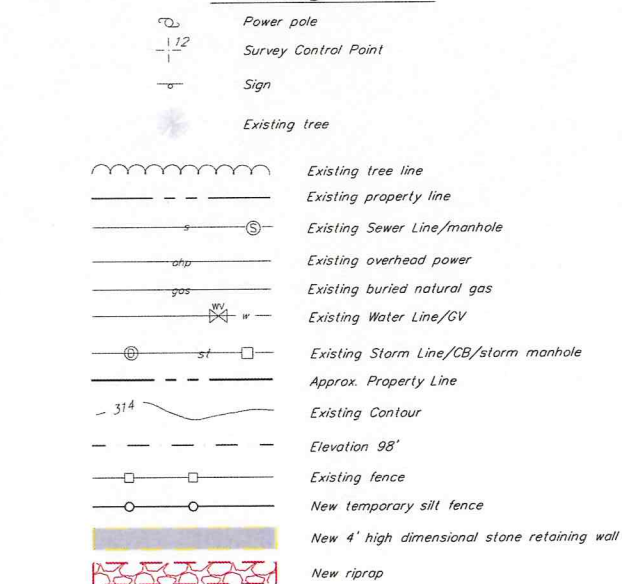
DEPARTMENT OF
PLANNING & ZONING



Typical Wall & Riprap Section
N.T.S.



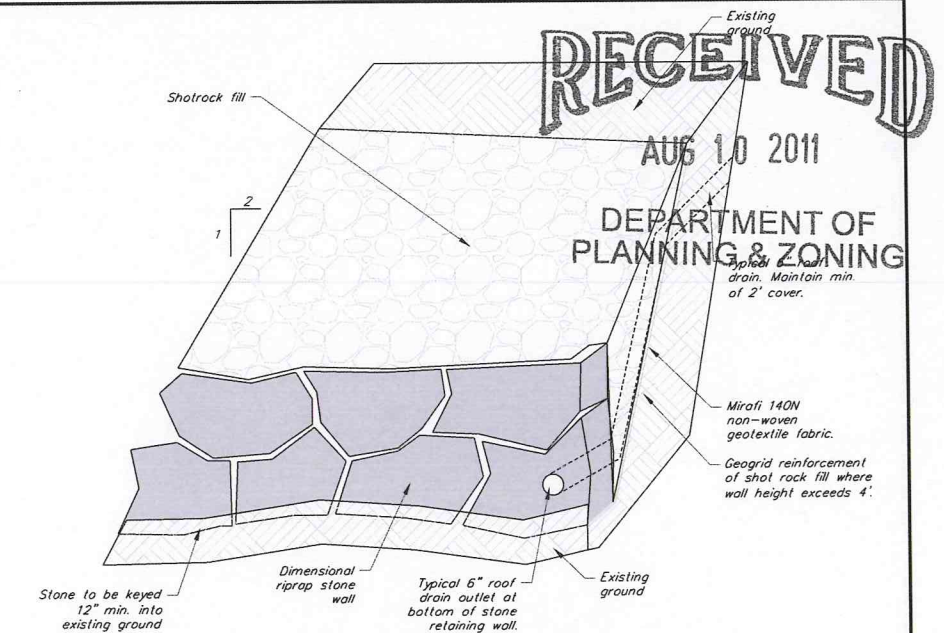
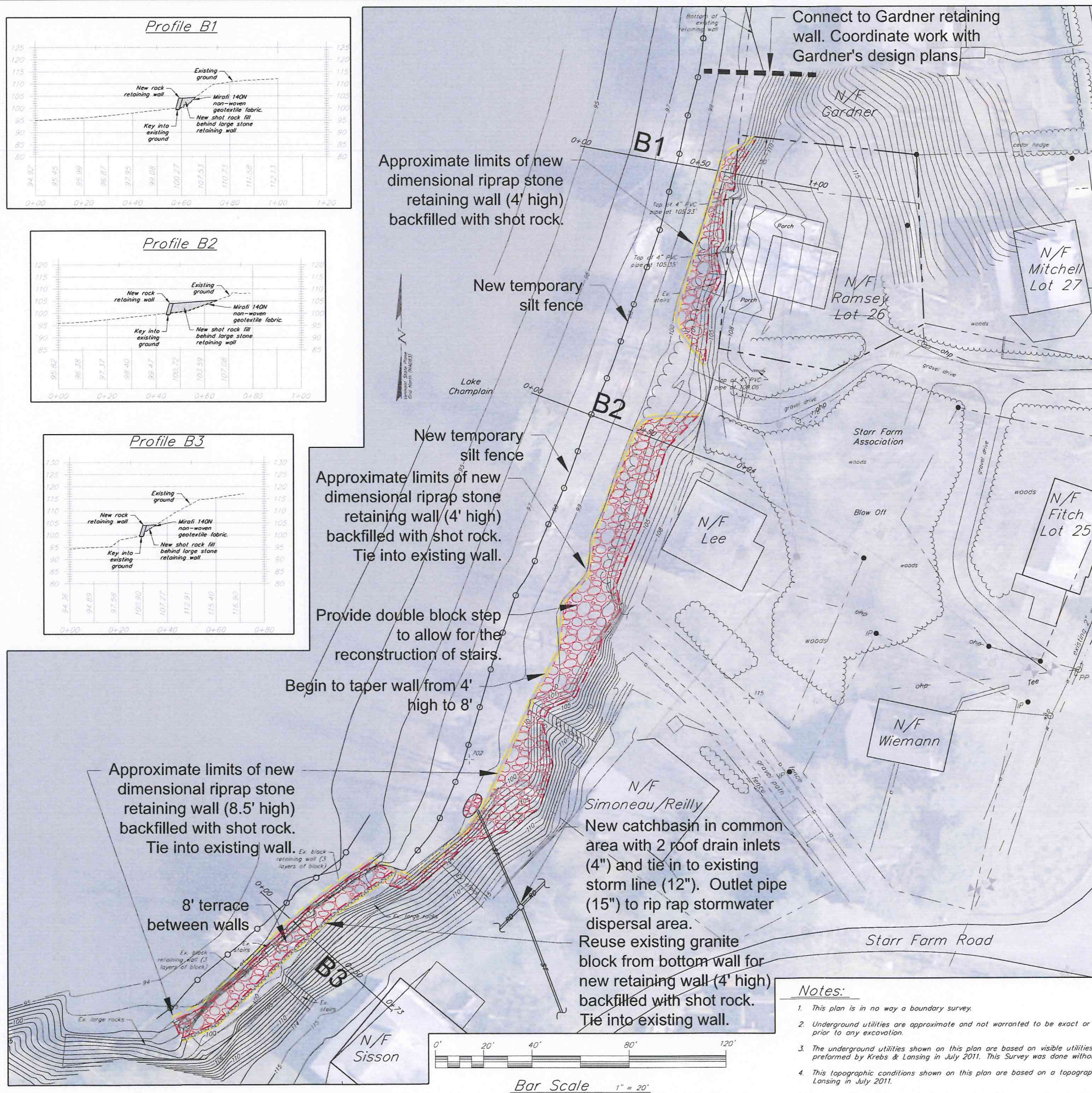
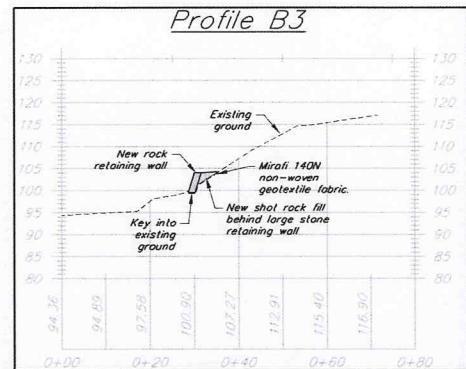
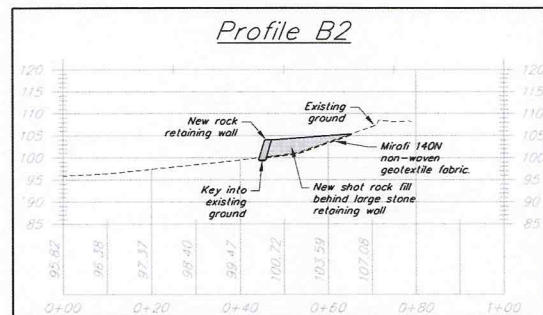
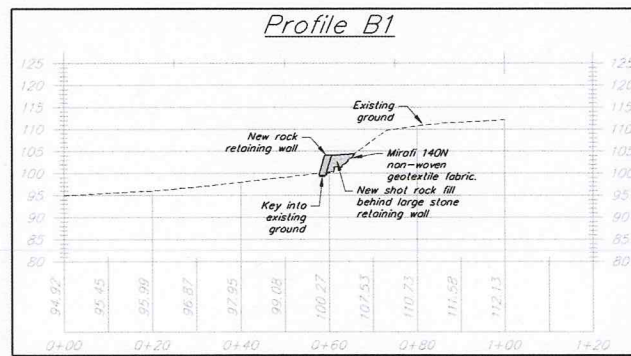
Legend



Notes:

1. This plan is in no way a boundary survey.
2. Underground utilities are approximate and not warranted to be exact or complete. Dig Safe shall be contacted prior to any excavation.
3. The underground utilities shown on this plan are based on visible utilities located during a topographic survey performed by Krebs & Lansing in July 2011. This Survey was done without the benefit of dig safe markings.
4. This topographic conditions shown on this plan are based on a topographic survey performed by Krebs & Lansing in July 2011.

Date revised	Description	Checked	Date
Design	SDG/AJ		
Drawn	SDG		
Checked	AJ		
Scale	1" = 20'		
Date	8/10/11		
Project	11172		
Starr Farm Road		Burlington, Vermont	
KREBS & LANSING Consulting Engineers, Inc.		164 Main Street, Colchester, Vermont 05446	
Lakeshore Reinforcement Plan		Starr Farm Beach Owners Association	
C1			



Typical Wall & Riprap Section
N.T.S.

Legend

Power pole	Existing Storm Line/CB/storm manhole
Survey Control Point	Approx. Property Line
Sign	Existing Contour
Existing tree	Elevation 98'
Existing property line	Existing fence
Existing tree line	Existing block wall
Existing Sewer Line/manhole	Existing rock
Existing overhead power	New 4' high dimensional stone retaining wall
Existing buried natural gas	New riprap
Existing Water Line/GV	
New temporary silt fence	



**Option A
Rip Rap**



**Option B
Stone with Rip Rap Fill**

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Design <u>SDG/AJ</u>	<i>Lakeshore Reinforcement Plan</i>		
Drawn <u>SDG</u>			
Checked <u>AJ</u>	<i>Starr Farm Beach Owners Association</i>		
Scale <u>1" = 20'</u>			
Date <u>8/10/11</u>			
Project <u>11172</u>	<i>Starr Farm Road</i>	<i>Burlington, Vermont</i>	
<i>KREBS & LANSING Consulting Engineers, Inc.</i>		<i>C2</i>	
<i>164 Main Street, Colchester, Vermont 05446</i>			

Lakeshore Reinforcement Plan
**Starr Farm Beach
Owners Association**

C2

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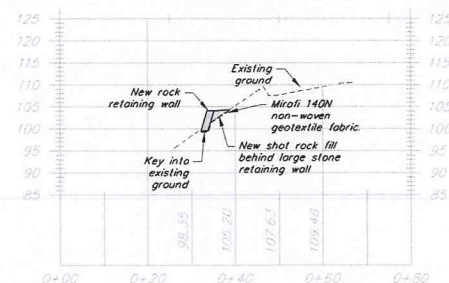
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DEPARTMENT OF
PLANNING & ZONING

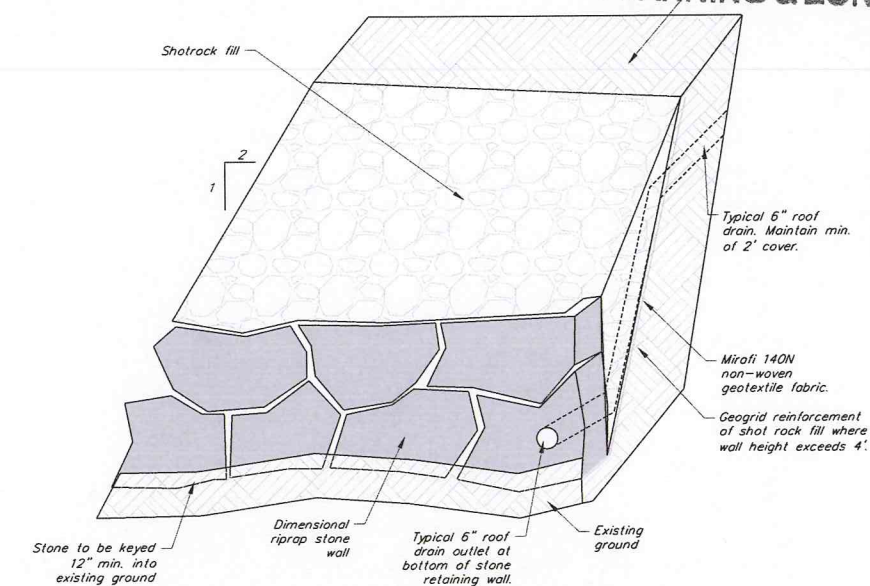
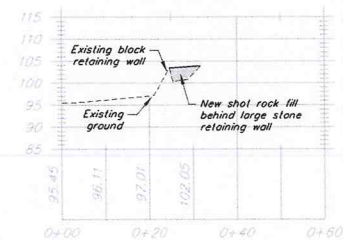
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- Power pole
- Survey Control Point
- Sign
- Existing tree
- Existing property line
- Existing tree line
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- Existing overhead power
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- Existing Water Line/GV
- Existing Storm Line/CB/storm manhole
- Approx. Property Line
- Existing Contour
- Elevation 98'
- Existing fence
- New temporary silt fence
- Existing block wall
- Existing rock
- New 4' high dimensional stone retaining wall
- New riprap

Profile C1

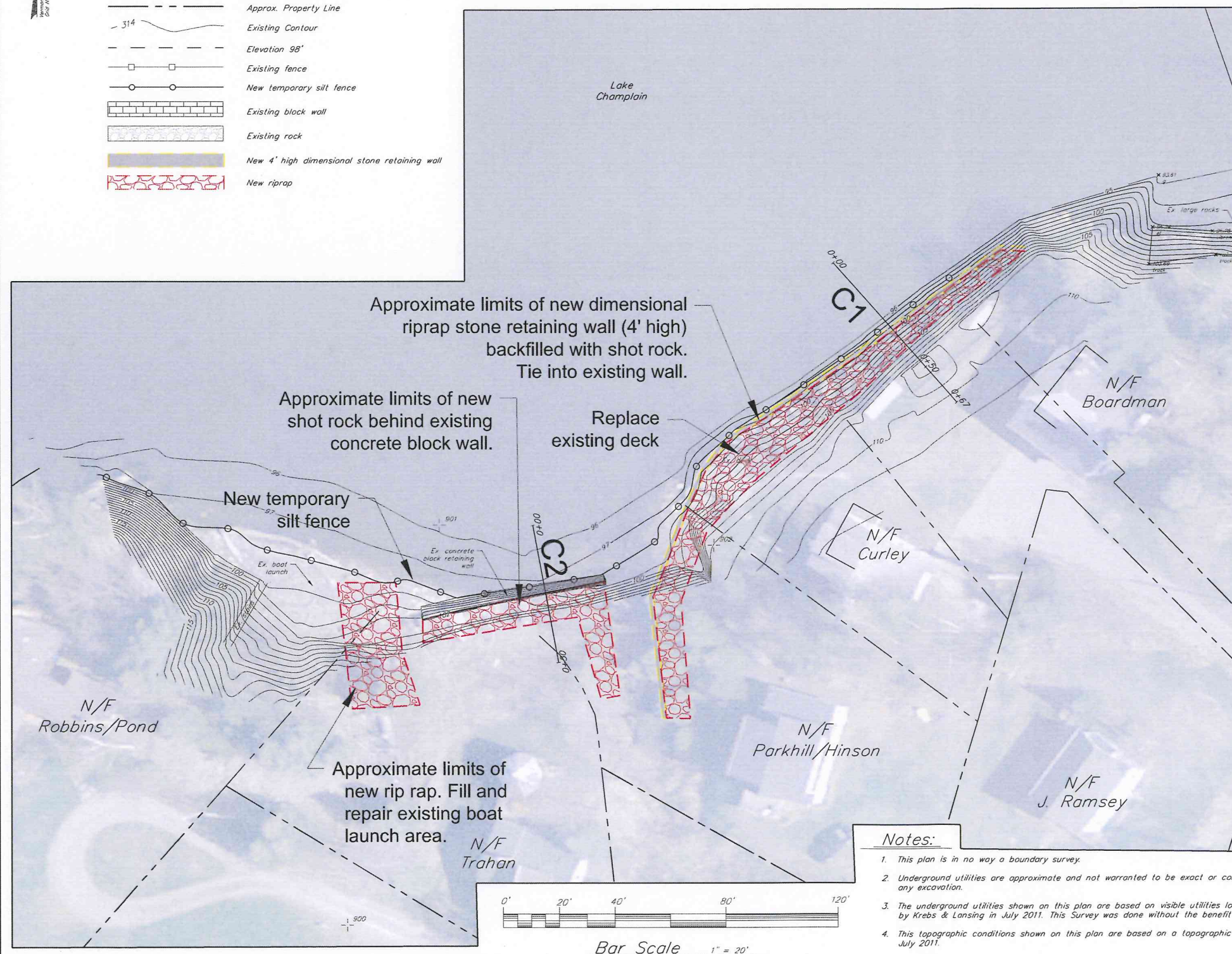


Profile C2



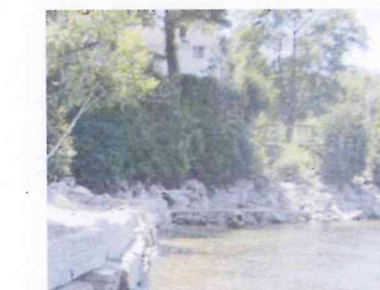
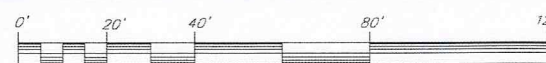
Typical Wall & Riprap Section

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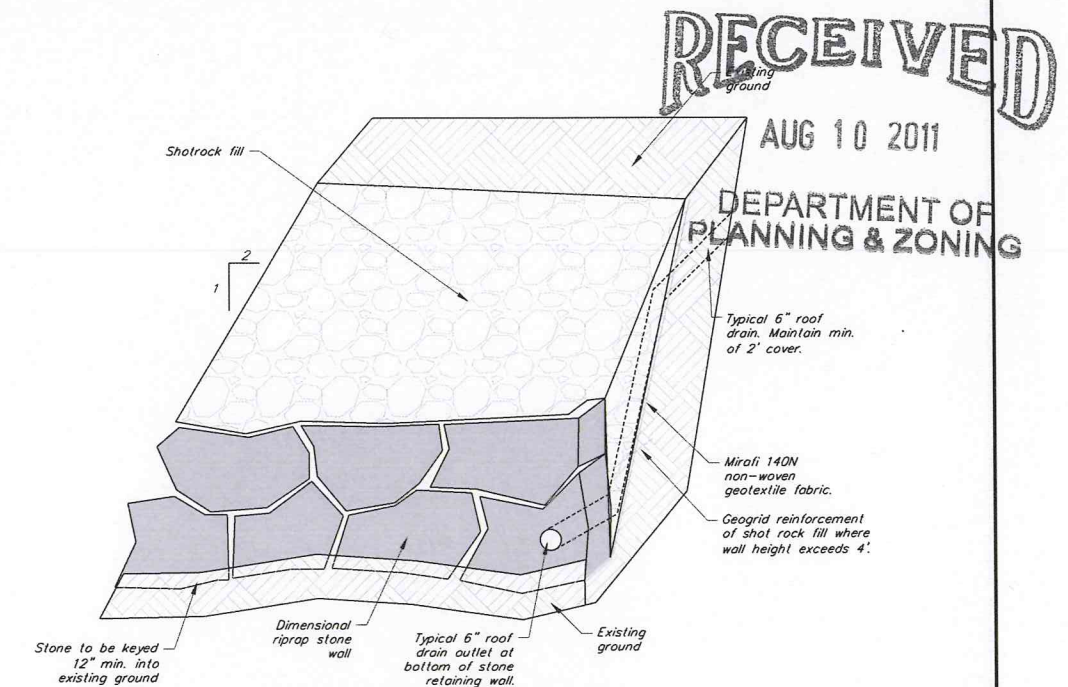
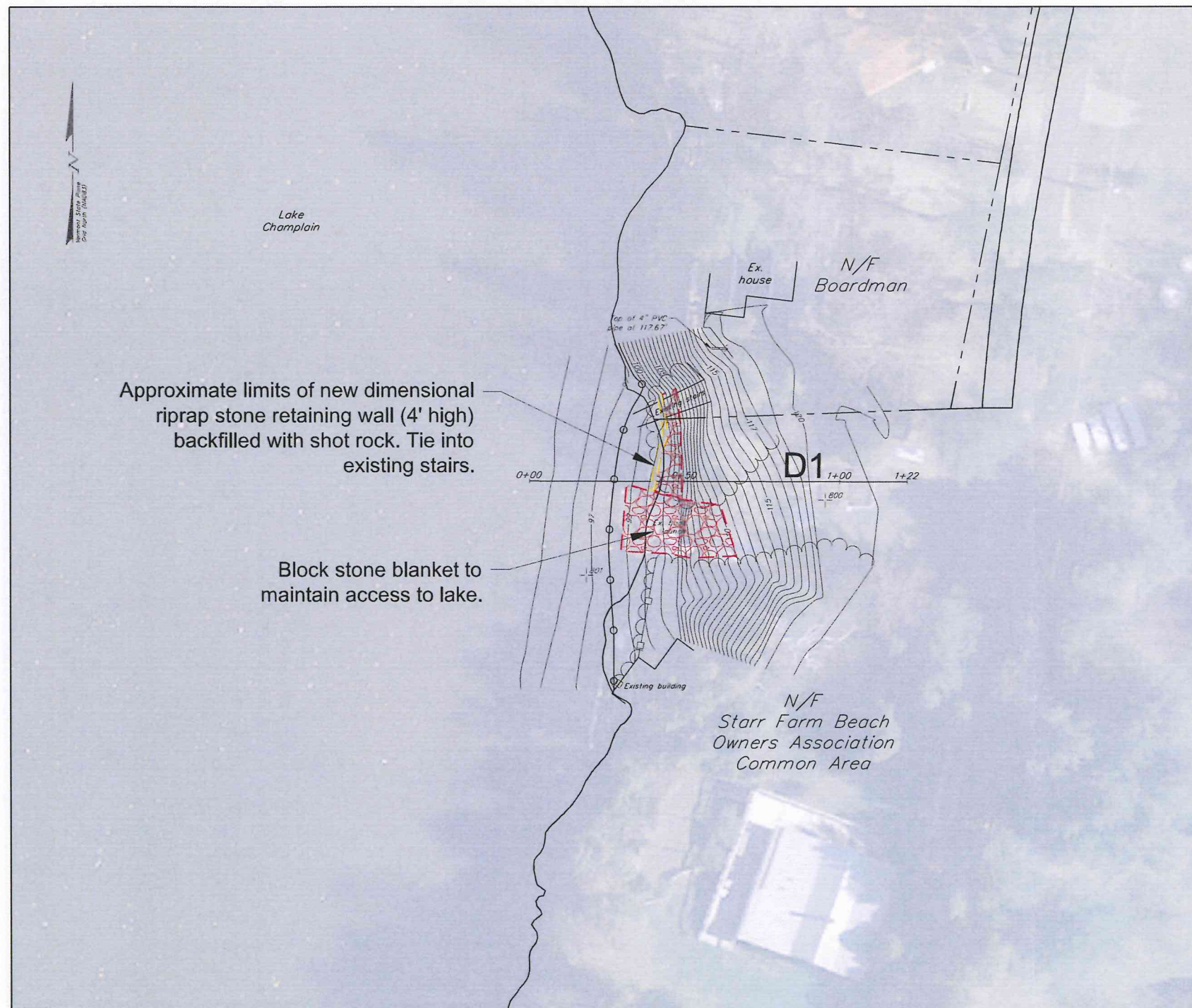
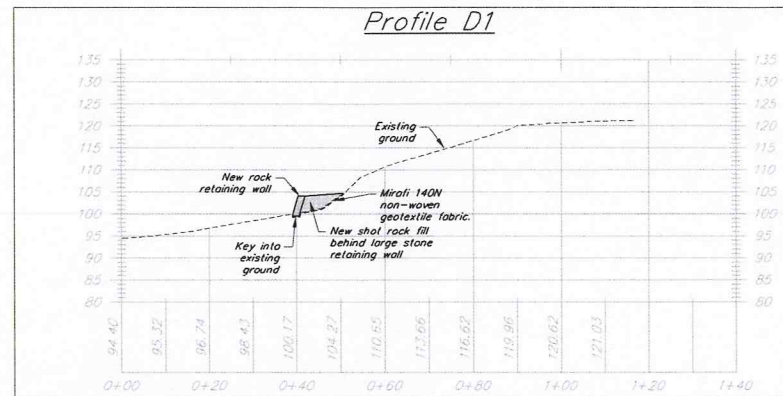
Option A
Rip Rap



Option B
Stone with Rip Rap Fill



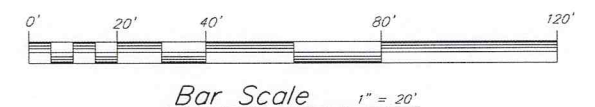
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Lakeshore Reinforcement Plan			
Starr Farm Beach Owners Association			
Starr Farm Road Burlington, Vermont			
KREBS & LANSING Consulting Engineers, Inc. 164 Main Street, Colchester, Vermont 05446			
C3			



Typical Wall & Riprap Section
N.T.S.

Legend

- Power pole
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- Existing tree
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- Existing tree line
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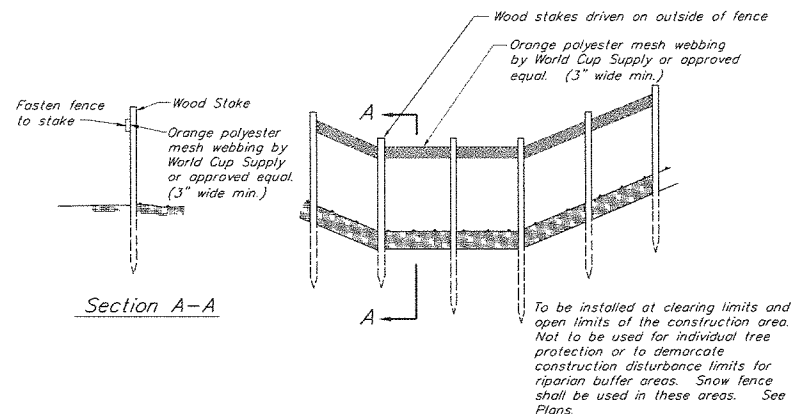
C4

The methods and materials of construction shall conform to the latest standards of the City of Burlington and the State of Vermont. All work shall be in conformance with all permits and approvals issued for the project. In case of conflict, the more stringent specification shall apply as determined by the Engineer. All work shall be done in a workmanlike manner and completed in the time specified by Owner.

- The Contractor shall be responsible for all work and materials shown and required to make the job complete. These drawings do not show every fitting or appurtenance. Materials shall be as specified on the drawings. Manufacturer's product specifications shall be submitted for all materials to the Engineer for approval prior to installation.
- The location and size of existing underground utilities is not warranted to be exact or complete. The Contractor shall field locate all utilities and shall contact the affected utility company, the Engineer and the City of Burlington prior to making any hook ups. The Contractor shall be solely responsible for all existing utilities and their uninterrupted services. All off-site backfill, sheet piling, sheet piling, sheet piling, sheet piling, sheet piling, erosion control, dust control, traffic control, grading, and all incidentals shall be included as part of the required work.
- Repair of all disturbed areas, grading, seeding, mulching, repair of roads and curbs, paving, and other incidentals are included as part of the required work. All disturbed areas shall be loamed and mulched until permanent ground cover is established.
- The Contractor shall verify all horizontal control and temporary bench marks before use.
- The workmen and public shall be protected by the Contractor from any and all hazards connected with the construction work. Open trenches, materials, or equipment within the working limits are to be guarded by the use of adequate barricades or flag men. All barricades left in position overnight are to be properly lighted. Kerosene pots are not acceptable. When narrow lanes the usable pavement, flag men shall be employed to aid the flow of traffic so that there will be no undue delays. The Contractor shall be held responsible for the safety of all workmen and the general public and all damages to property occurring from or upon the work occasioned by negligence or shall be held responsible for the safety of all workmen and the general public and all damages to property occurring from or upon the work occasioned by negligence or day or night within the working area. All work shall be in conformance to OSHA regulations, Title 19, Parts 1926.651 and 1926.652, and applicable to VOSHAs regulations.
- Preconstruction Excavation areas shown on the plan shall be completed prior to beginning site utility work and prior to ordering structures. The Contractor shall allow the Engineer one week to provide design decisions based on information obtained from the Preconstruction Excavation. The Contractor shall contact the Engineer at least 24 hours in advance of performing the excavation. In addition to the designated Preconstruction Excavations, the Contractor shall verify all utility intersections and contact Engineer and Owner with conflicts.
- Contractor shall contact Dig Safe prior to any excavation.
- All new storm extending from catch basin structures shall be laid with a laser to elevation and slope as shown on the plans.
- The Contractor shall sawcut all existing pavement to be removed. The Contractor shall minimize the pavement area disturbed. The Contractor shall be responsible for all pavement repair and restoration necessary to complete the work.
- Temporary site fence shall be erected prior to any clearing or construction. Fencing may be erected in phases, but in no case shall construction of clearing proceed fencing. Special areas may be designated by the Owner for preservation of existing trees. These areas shall be the Contractor's responsibility to insure no damage is done to designated trees.
- Existing plantings are located in general areas as shown on the plans. Contractor shall protect plantings scheduled to remain so as not to damage these or their root systems.
- Contractor shall verify all Utility intersections by excavation at least 300 ft. in advance of all pipe laying activities. The Engineer and Owner must be contacted with conflicts. Failure to comply with project requirements shall severely limit the Contractor from pursuing any claim to compensation resulting from conflicts with the existing utilities.
- Contractor shall comply with all permits and approvals issued for this project.
- Slope stability upon unsaturated soil conditions. If during construction saturated soils are encountered, contact the Engineer immediately.

1. Topsoil shall have a minimum 4" depth unless additional depth is specified on the plans (including Landscaping design). Topsoil shall be natural, fertile, friable soil representative of local productive soil and free of clay clumps, subsoil or other foreign matter larger than two inch diameter, not frozen or muddy. Acidity range PH 5-7 not less than three (3) percent humus. Samples will be required to be tested at the UVM extension service. All testing costs will be paid by the Contractor.
2. All turf establishment shall be in accordance with Section 651 of the current VT Standard Specifications. Stabilization shall follow seeding by no more than 24 hours.
3. Commercial fertilizer shall be a complete plant food containing nitrogen (50% organic) phosphoric acid and potash. Soil tests will indicate composition required.
4. Hydro seeding is the preferred practice for seed application. Specifications are:

Fertilizer:	19-19-19	75 lbs	per 1,000 gallons of water
lime:	100 lbs.	per 1,000 gallons of water	
Seed:	Tall Fescue	50 lbs	Kyr 31
	Cresting Red Fescue	60 lbs	Pennlawn, Wintergreen, Ensywe
	Annual Rye	30 lbs	
	Perennial Rye	20 lbs	Prana (non endophyte)
	White Clover	20 lbs	
	Kentucky Bluegrass	20 lbs	
	Total	200 lbs	per acre
Mulch:	300 lbs.	per 1,000 gallons of water.	
Tocifer:	5 lbs.	per 1,000 gallons of water.	
5. The grass seed may be applied by hand method or hydroseeding at a rate of 6 lbs. per 1,000 sq. ft.
6. If hand seeding, straw or hay mulch shall be used and secured by netting (either organic or inorganic). If inorganic netting is used, it must be removed before the first mowing.
7. Starter fertilizer shall be applied at the normal rate at the time of seeding. Fertilizer application will not be allowed in sensitive areas and adjacent to drainage ways as determined by the Engineer.
8. Watering is to be done by the Contractor to maintain proper growth. The Owner will supply the water, but apparatus necessary to apply the water must be furnished by the Contractor (i.e. hoses, sprinklers, etc).
9. Staking of all topsoiled areas to control foot traffic will be required. Acceptable staking materials will be grade stakes and twine or string with flagging attached for visibility.
10. A guarantee between the first mowing is required with any sparse or bare areas larger than 1 sq. ft. to be redone.
11. The Contractor is responsible for the first mowing.



Spacing varies depending on channel slope

Same Elevation

Toe

Crest

24" Max. @ Center

PROFILE

Not To Scale

3/4" to 1-1/2" crushed stone

9" Min.

1.5' Min.

Mirafi 140N Filter Fabric

Cutoff trench design bottom

SECTION A-A

Not To Scale

Mirafi 140N Filter Fabric

SECTION B-B

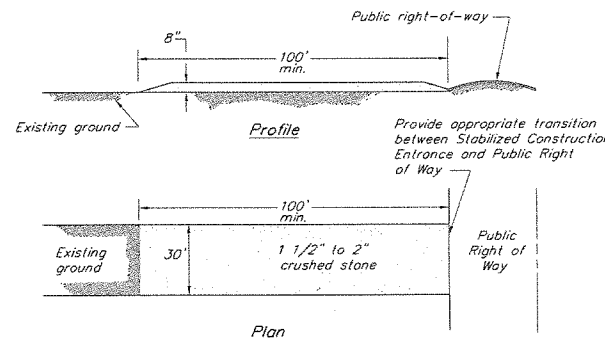
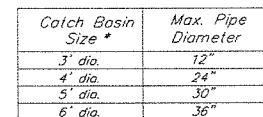
Not To Scale

24" Max. Center

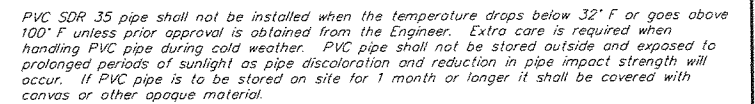
3/4" to 1-1/2" crushed stone

1. Stone will be placed on a filter fabric foundation to the lines, grades and locations shown in the plan.
2. Set spacing of check dams to assume that the elevations of the crest of the downstream dam is at the same elevation of the toe of the upstream dam.
3. Extend the stone a minimum of 1.5 feet beyond the ditch banks to prevent cutting around the dam.
4. Protect the channel downstream of the lowest check dam from scour and erosion with stone or liner as appropriate.
5. Ensure that channel appurtenances such as culvert entrances below check dams are not subject to damage or blockage from displaced stones.

N. T. S.



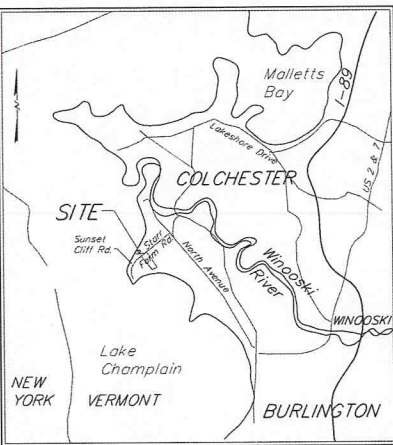
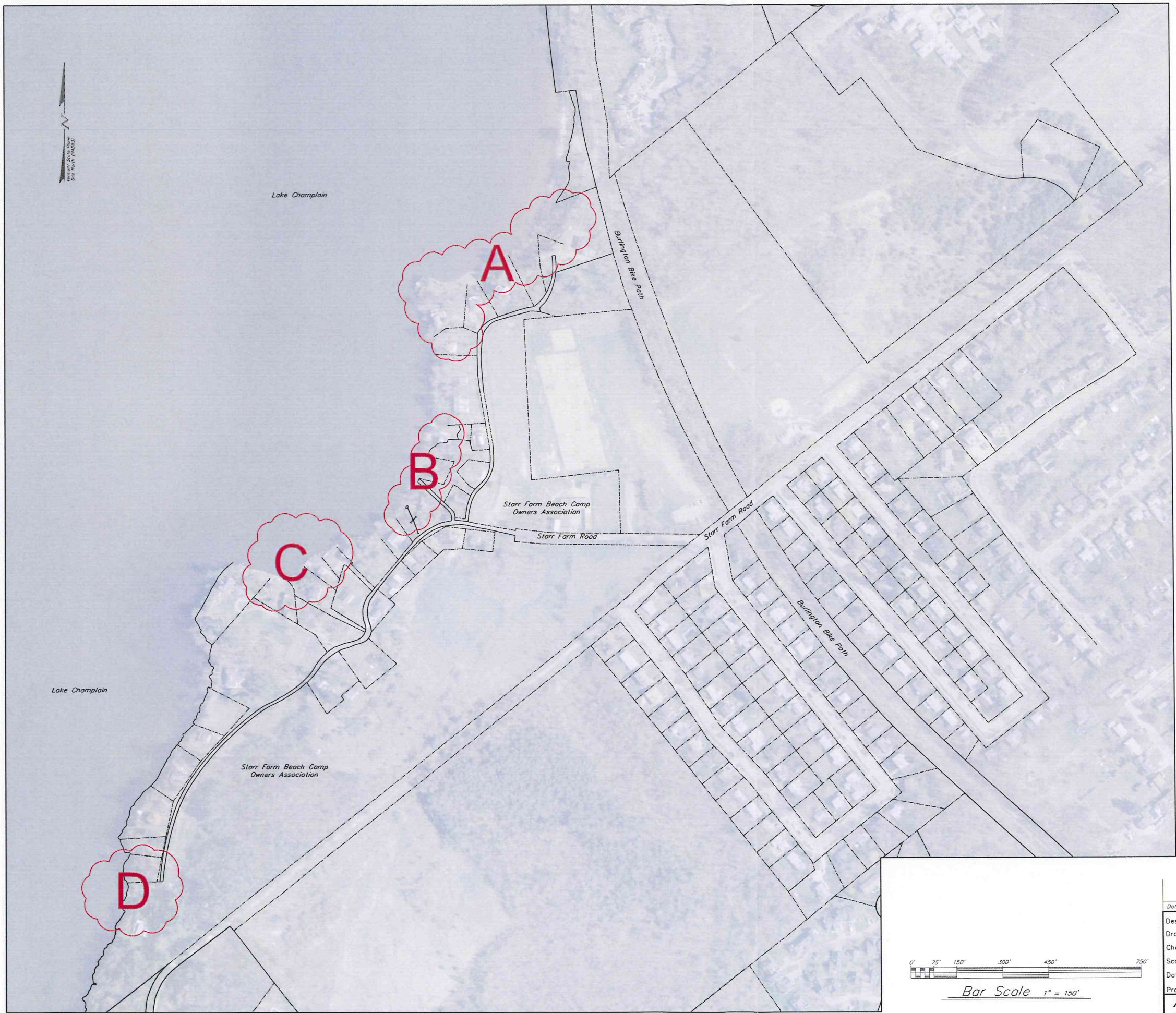
N.T.S.



N.T.S.

Backfill material under roads or paved areas must pass subgrade proof roll. Any trench area that does not successfully proof roll shall, at the Contractor's expense, have sufficient material removed and replaced with acceptable embankment material and compacted to provide acceptable proof roll conditions.

Date revised	Description	Checked	Date
Design	<p align="center"><i>Details</i></p> <p align="center"><i>Starr Farm Beach Owners Association</i></p>		
Drawn <u>SDG</u>			
Checked			
Scale <u>N.T.S.</u>			
Date <u>8/10/11</u>			
Project <u>11172</u>	<u>Starr Farm Road</u>	<u>Burlington, Vermont</u>	
KREBS & LANSING Consulting Engineers, Inc. 164 Main Street, Colchester, Vermont 05446		File name: Day Month Yearstamp Year Day Drawing size	<div style="font-size: 2em; border: 1px solid black; padding: 5px; display: inline-block;">D1</div>



Location Map
n.t.s.

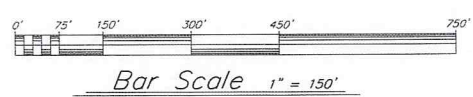
Legend

- A** New or Repaired Retaining Walls
- Existing property line

Notes:

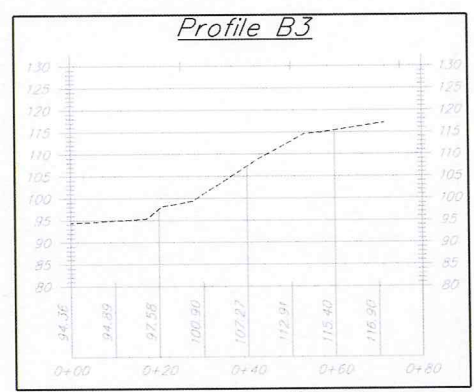
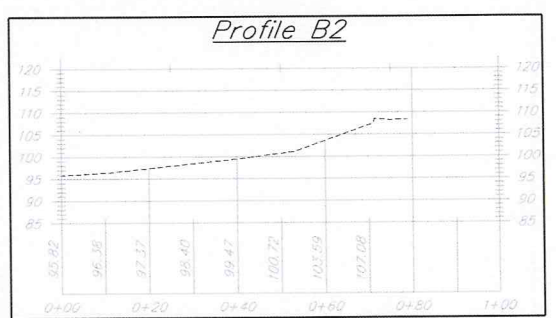
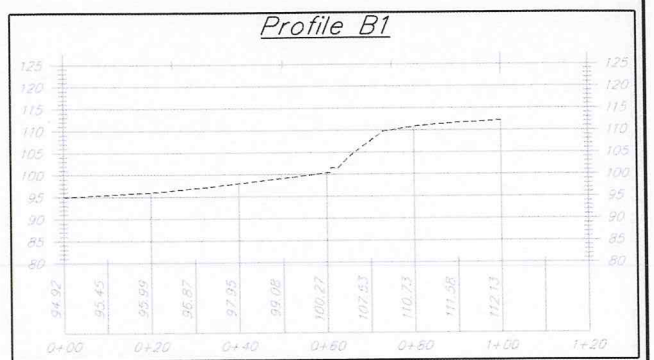
1. This plan is in no way a boundary survey.
2. Underground utilities are approximate and not warranted to be exact or complete. Dig Safe shall be contacted prior to any excavation.
3. The underground utilities shown on this plan are based on visible utilities located during a topographic survey performed by Krebs & Lansing in July 2011. This Survey was done without the benefit of dig safe markings.
4. This topographic conditions shown on this plan are based on a topographic survey performed by Krebs & Lansing in July 2011.

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Date revised	Description	Checked	Date
Design	SDG/IAJ		
Drawn	SDG		
Checked	IAJ		
Scale	1" = 150'		
Date	8/10/11		
Project	11172		
Starr Farm Road		Burlington, Vermont	
KREBS & LANSING Consulting Engineers, Inc.		01	
164 Main Street, Colchester, Vermont 05446			





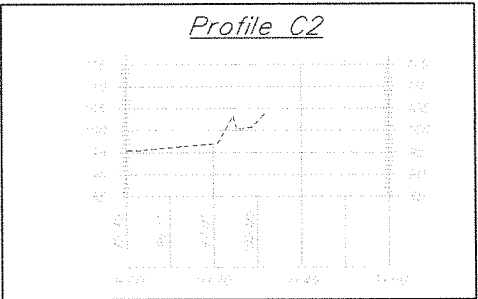
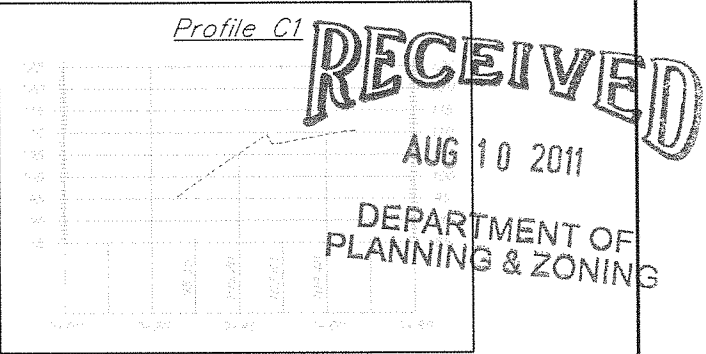
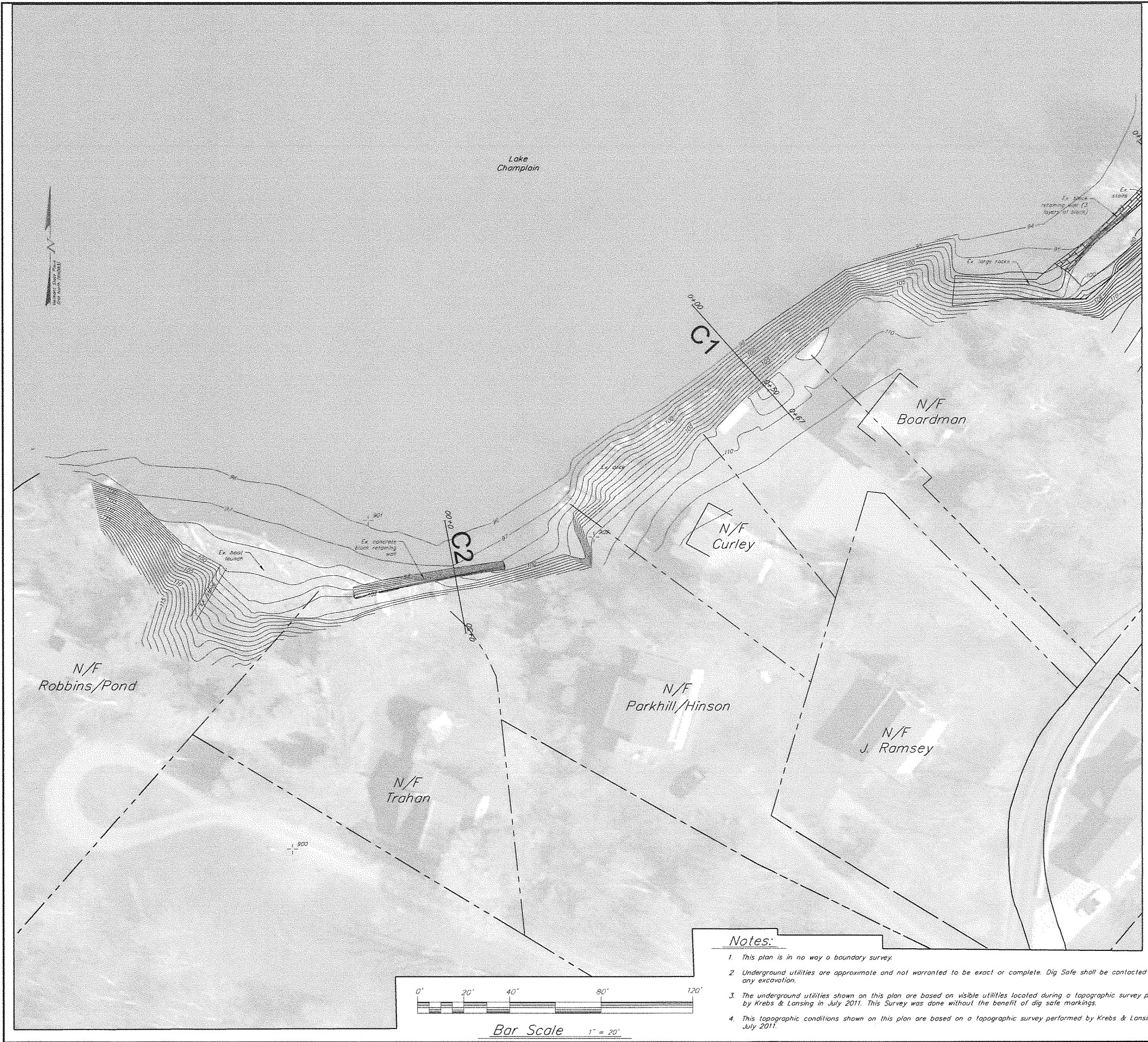
Legend

	Power pole
	Survey Control Point
	Sign
	Existing tree
	Existing property line
	Existing tree line
	Existing Sewer Line/manhole
	Existing overhead power
	Existing buried natural gas
	Existing Water Line/CV
	Existing Storm Line/CB/storm manhole
	Approx. Property Line
	Existing Contour
	Elevation 98'
	Existing fence
	Existing block wall
	Existing rock

Notes:

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4. This topographic conditions shown on this plan are based on a topographic survey performed by Krebs & Lansing in July 2011.

Date revised	Description	Checked	Date
Design	SDG/AJ		
Drawn	SDG		
Checked	AJ		
Scale	1" = 20'		
Date	8/10/11		
Project	11172		
Starr Farm Beach Owners Association		Burlington, Vermont	
KREBS & LANSING Consulting Engineers, Inc.		164 Main Street, Colchester, Vermont 05446	
		E2	



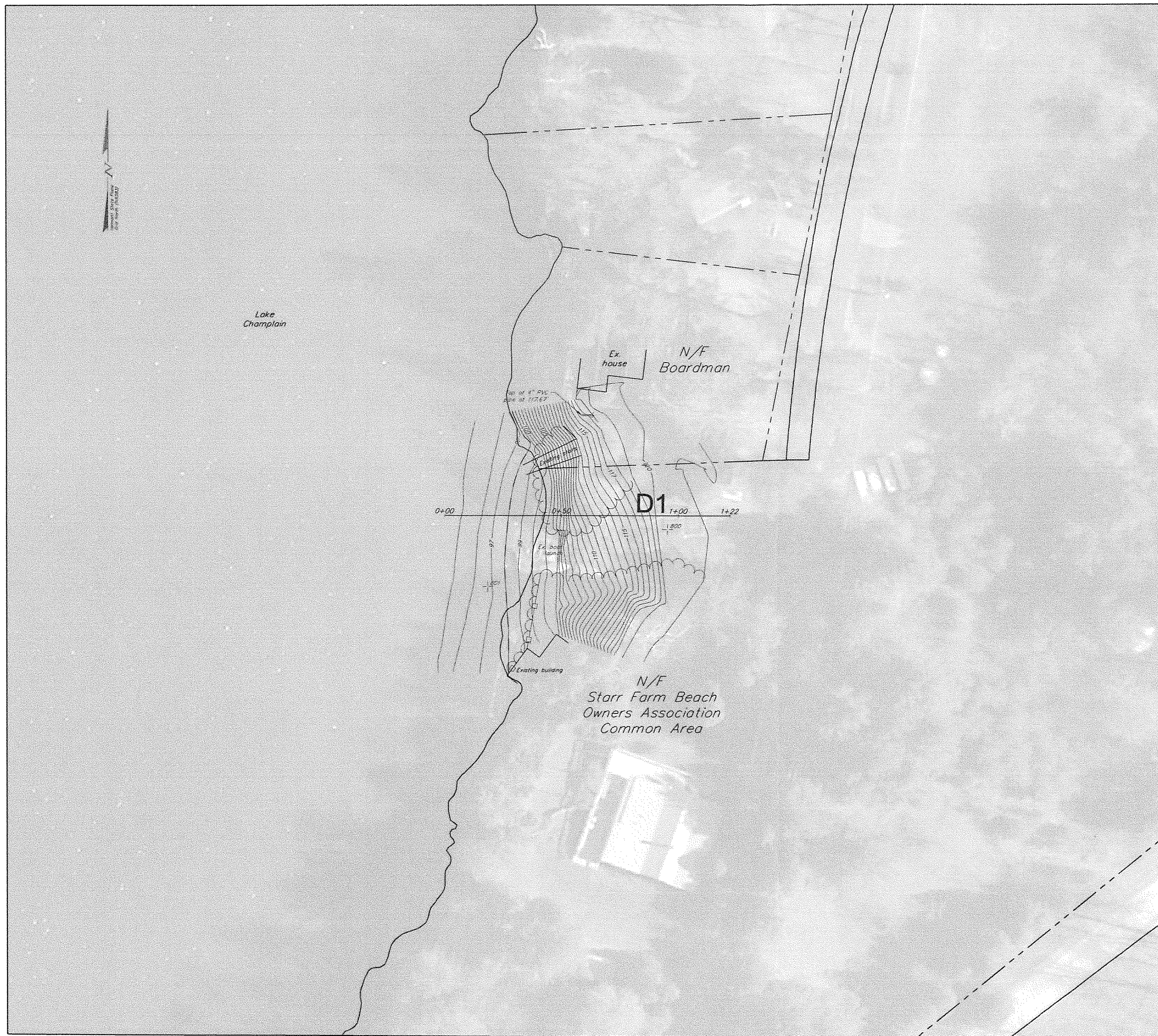
Legend

	Power pole
	Survey Control Point
	Sign
	Existing tree
	Existing property line
	Existing tree line
	Existing Sewer Line/manhole
	Existing overhead power
	Existing buried natural gas
	Existing Water Line/CV
	Existing Storm Line/CB/storm manhole
	Approx. Property Line
	Existing Contour
	Elevation 98'
	Existing fence
	Existing block wall
	Existing rock

Notes:

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4. This topographic conditions shown on this plan are based on a topographic survey performed by Krebs & Lansing in July 2011.

Date revised	Description	Checked	Date
Design SDG/IAJ	Existing Conditions		
Drawn SDG	Starr Farm Beach Owners Association		
Checked IAJ			
Scale 1" = 20'			
Date 8/10/11			
Project 11172	Starr Farm Road	Burlington, Vermont	
KREBS & LANSING Consulting Engineers, Inc. 164 Main Street, Colchester, Vermont 05446			
The work of this firm shall be held in confidence by the client.			E3



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AUG 10 2011

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PLANNING & ZONING

Notes:

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4. This topographic conditions shown on this plan are based on a topographic survey performed by Krebs & Lansing in July 2011.

Legend

- Power pole
- Survey Control Point
- Sign
- Existing tree
- Existing property line
- Existing tree line
- Existing Sewer Line/manhole
- Existing overhead power
- Existing buried natural gas
- Existing Water Line/GV
- Existing Storm Line/CB/storm manhole
- Approx. Property Line
- Existing Contour
- Elevation 98'
- Existing fence
- Existing block wall
- Existing rock



Bar Scale 1" = 20'

Date revised	Description	Checked	Date
Design <u>SDG/IAJ</u>	Existing Conditions		
Drawn <u>SDG</u>	Starr Farm Beach Owners Association		
Checked <u>IAJ</u>			
Scale <u>1" = 20'</u>			
Date <u>8/10/11</u>			
Project <u>11172</u>	Starr Farm Road	Burlington, Vermont	
KREBS & LANSING Consulting Engineers, Inc. 164 Main Street, Colchester, Vermont 05446			
			E4